National TRU Waste Management Plan

Quarterly Supplement
April 2001

U.S. Department of Energy
Carlsbad Field Office

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Introduction

The U.S. Department of Energy (DOE) is committed to honoring the federal government's obligation to clean up "legacy" waste at sites across the nation that supported nuclear research and development, and the production and testing of nuclear weapons. It is the objective of DOE Order 435.1, "Radioactive Waste Management," to ensure that all DOE radioactive waste is managed in a manner that is protective of worker and public health and safety, and the environment. Per this Order, DOE is responsible for developing, implementing, and maintaining integrated complex-wide radioactive waste management program plans. At the DOE complex-wide level, each plan describes the functional elements, organizations, responsibilities, and activities that comprise the system needed to store, treat, and dispose of waste. In addition, the DOE is responsible for establishing and maintaining a system to compile waste generation projection data and other information concerning waste management facilities, operations, and activities. The issuance of the National Transuranic (TRU) Waste Management Plan (NTWMP), Revision 2, dated December 2000 fulfilled this obligation.

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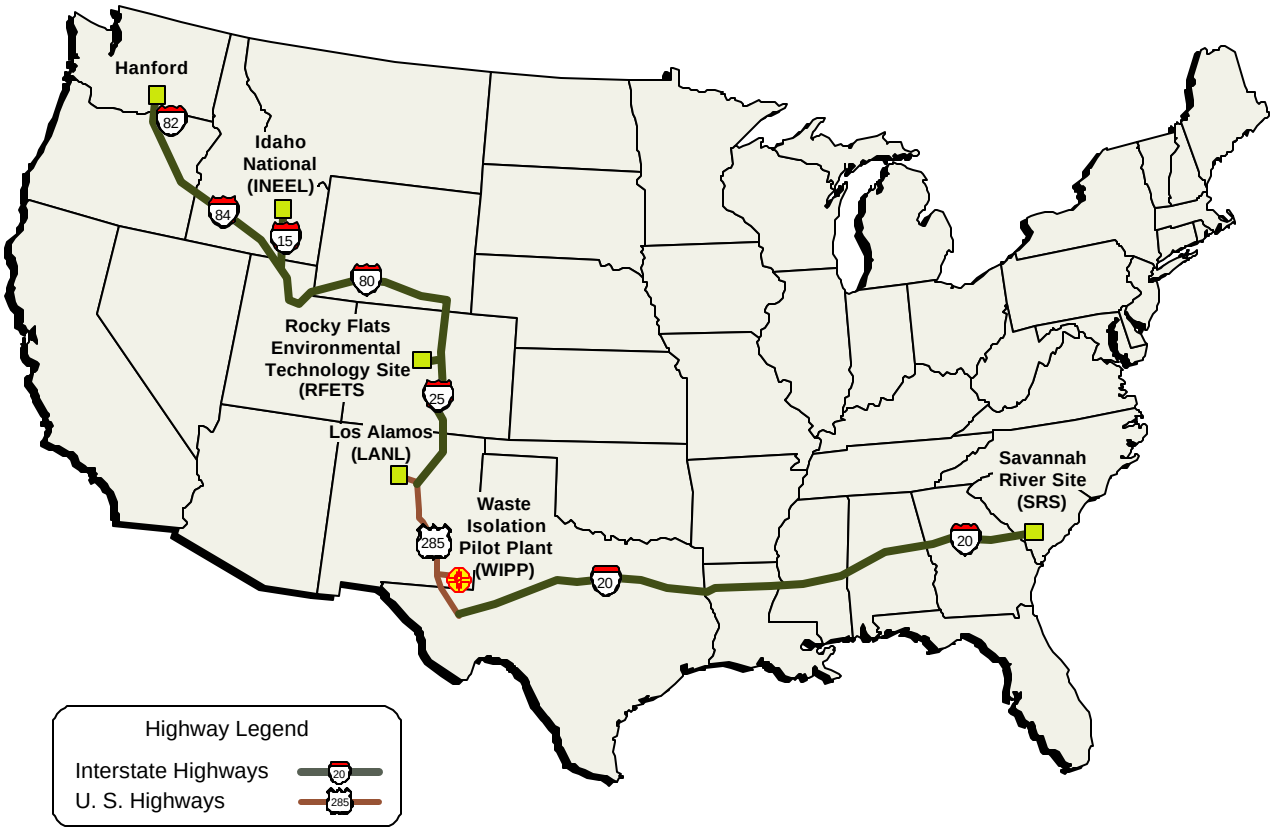
This Quarterly Supplement documents site and system-wide performance as of March 31, 2001 through Performance Indicators (PIs) developed in the NTWMP. The DOE uses PIs to measure the progress and success of the many activities within the national TRU system that contribute toward the ultimate goal of TRU waste disposal. PIs are sets of tailored metrics that are used to report current status, monitor the effects of changes, determine progress, and provide feedback for continuous system improvement.

Therefore, the PIs tracked in this Quarterly Supplement:

- Plot actual performance against the baseline schedules provided for inclusion in the NTWMP by each site's TRU program and TRU waste managers;
- Highlight items of concern that impact the overall TRU waste system; and
- Status progress toward resolving technical and programmatic issues, including recommendations made in the recent National Academy of Sciences report entitled, "Improving Operations and Long-Term Safety of the Waste Isolation Pilot Plant."

The Quarterly Supplement also analyzes for impacts on system schedules. The NTWMP is revised annually, showing new schedules provided by each site's TRU program and TRU waste managers with updated PIs based on the schedules. Variances from the previous year's schedules having an impact on out-year system capabilities are addressed. Finally, an update to the baseline will be performed when a major initiative is implemented that has an effect on system performance (e.g., a change to characterization methodologies that decreases required activity levels and allows increased shipping/disposal rates).



Prior to generator sites shipping waste to the Waste Isolation Pilot Plant (WIPP), the corridors (or routes) over which the waste will be transported must be "opened." The opening of the shipping corridor includes informing the general public and the elected officials of the associated risk and effectively responding to their concerns. State and tribal governments require emergency preparedness training, training exercises, and hospital-based training to ensure that any accident that may occur can be managed locally.

A corridor is considered open when, prior to the announced generator site shipping date, requests for training and exercises have been completed to the satisfaction of the state or tribal government. Corridors from the Hanford Site, the Idaho National Engineering and Environmental Laboratory, the Rocky Flats Environmental Technology Site, the Los Alamos National Laboratory, and the Savannah River Site to WIPP are open.

Performance Indicators

This Quarterly Supplement documents site and system-wide performance through Performance Indicators (PIs) developed in the NTWMP. The DOE uses PIs to measure the progress and success of activities within the national TRU system that contribute toward the ultimate goal of TRU waste disposal. PIs are sets of tailored metrics that are used to report current status, monitor the effects of changes, determine progress, and provide feedback for continuous system improvement.

Benefits to be derived from PIs include:

- PIs provide accountability. Federal employees and contractors are accountable regarding stewardship of monetary resources by showing progress toward national goals.
- PIs help validate programs and their costs. In an era of shrinking federal budgets, demonstration of good performance and sustainable public impacts with positive results help validate programs and their costs.
- PIs provide trend analysis to determine the need to implement contingency planning. Management of products and services can be improved by analyzing trends and focusing resources.
- PIs improve communications. Collecting and processing accurate information for PIs facilitates communications regarding mission-critical activities.

Performance measurement is also mandated by the Government Performance and Results Act of 1993. In addition, DOE Order 435.1, "Radioactive Waste Management," requires that the goals of all DOE waste management programs be measurable to support periodic assessment of the program's progress.

Within the DOE TRU waste system, PIs serve four basic functions:

- Provide measurable results so the National TRU Waste Program administrators can demonstrate progress towards goals and objectives. The progress of individual elements is demonstrated by providing specific measurement results that aggregate to system-wide measures.
- Determine the effectiveness of each element of the program. PIs show how well each element is meeting its goals and objectives.
- Characterize the performance of the DOE TRU waste system. Impacts caused by a variance from an individual site's planned schedule can be assessed.
- Allow assessment of program successes so that resources can be reallocated to projects where they have the most positive impact to system performance.

The PIs tracked within the DOE TRU waste system support completion dates listed in the Status Report on *Paths to Closure* (DOE/EM-0526, March 2000).

Each site that has activity planned in FY 2001 has PIs presented on:

- Volume shipped (Actual versus Annual Planned) (cumulative).
- Number of shipments (Actual versus Annual Planned) (cumulative).

In addition to the Actual Volume and Shipments, and the Planned Volume and Shipments presented for each site, forecast values for volumes and shipments are updated quarterly to show current planning. These Forecast values are depicted on the figures for each site along with the Actual and Planned values.

Hanford Reservation

Background

The first shipment from the Hanford Reservation (Hanford) was shipped on July 12, 2000 and was received at WIPP on July 14, 2000. Through March 31, 2001, a total of 6 shipments from Hanford representing 45.2 m^3 have been received.

Current Fiscal Year

As of March 31, 2001, during FY01, Hanford has shipped 3 shipments with a total volume of 26.5 m^3. In comparison to initial planning for FY01, Hanford had planned to ship 3 shipments consisting of 20.4 m^3 during this same time period.

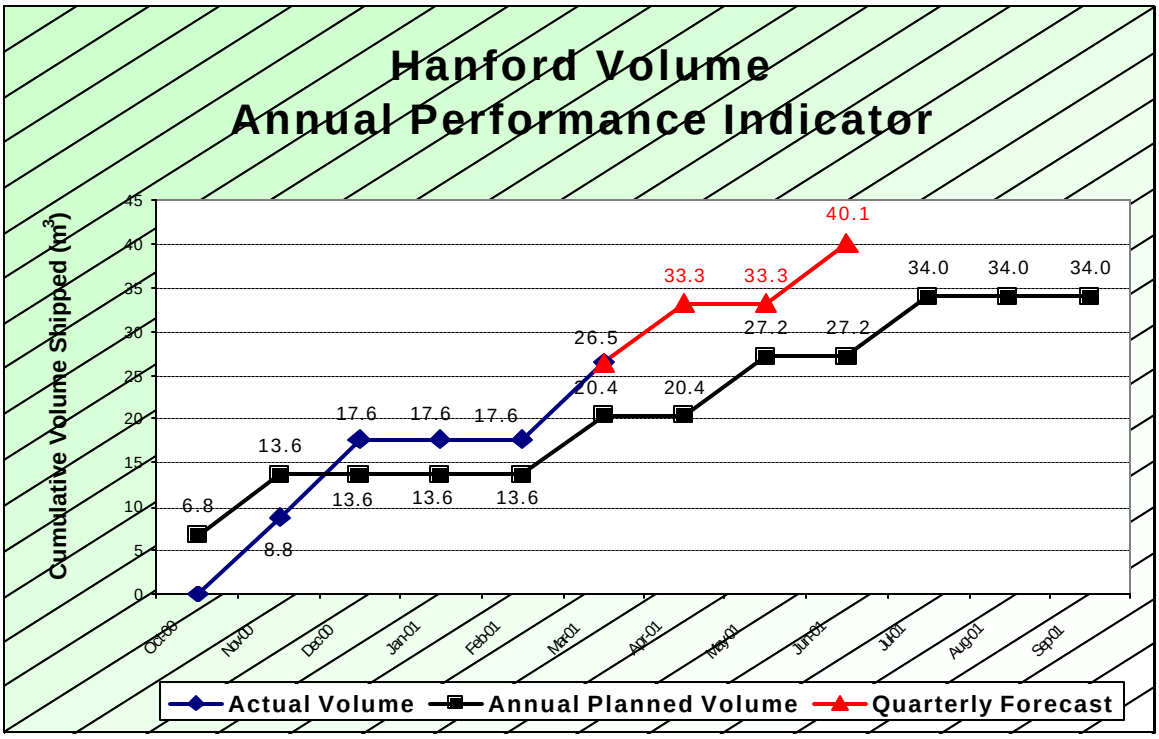
Current Fiscal Year Forecast

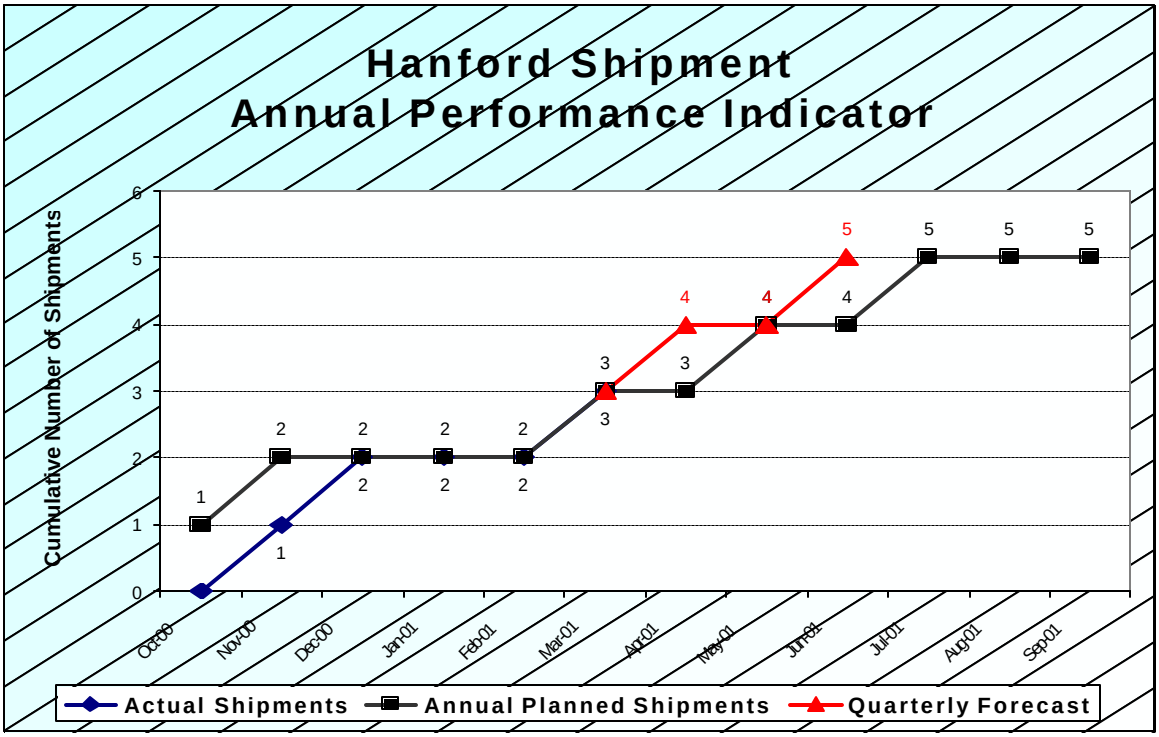
During the remainder of FY01, Hanford is planning to ship 2 more shipments. A total waste volume of 34 m^3 is planned at the end of FY01.

Performance Indicators

The Performance Indicators are graphically shown in the following figures:

- Hanford Volume Annual Performance Indicator - the actual volume shipped versus the planned volume to be shipped during FY01. The next quarter forecast is shown in red.
- Hanford Shipment Annual Performance Indicator - the actual number of shipments versus the planned number of shipments during FY01. The next quarter forecast is shown in red.


Hanford Volume
Annual Performance Indicator
Cumulative Volume Shipped (m3)
0
5
10
15
20
25
30
35
40
45
Oct-00
Nov-00
Dec-00
Jan-01
Feb-01
Mar-01
Apr-01
May-01
Jun-01
Jul-01
Aug-01
Sep-01
6.8
13.6
17.6
17.6
17.6
26.5
33.3
33.3
40.1
8.8
13.6
13.6
13.6
20.4
20.4
27.2
27.2
34.0
34.0
34.0
Actual Volume
Annual Planned Volume
Quarterly Forecast


Hanford Shipment
Annual Performance Indicator
Cumulative Number of Shipments
0
1
2
3
4
5
6
Oct-00
Nov-00
Dec-00
Jan-01
Feb-01
Mar-01
Apr-01
May-01
Jun-01
Jul-01
Aug-01
Sep-01
1
2
2
2
2
3
4
4
5
1
2
2
2
2
3
3
4
5
5
5
Actual Shipments
Annual Planned Shipments
Quarterly Forecast

Idaho National Engineering and Environmental Laboratory

Background

The first shipment from the Idaho National Engineering and Environmental Laboratory (INEEL) was shipped on April 27, 1999 and was received at WIPP on April 28, 1999. Through March 31, 2001, a total of 54 shipments from INEEL representing 351.3 m^3 have been received.

Current Fiscal Year

As of March 31, 2001, during FY01, INEEL has shipped 38 shipments consisting of 229.3 m^3. In comparison to initial planning for FY01, INEEL had planned to ship 65 shipments consisting of 443.3 m^3 during this same time period.

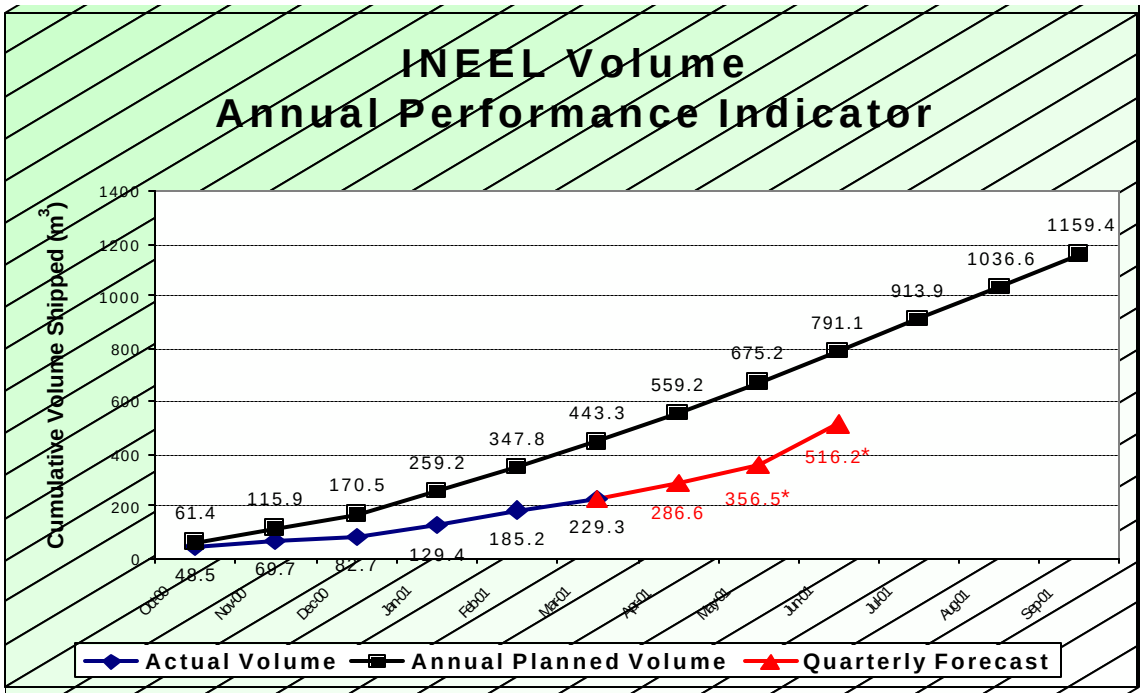
Current Fiscal Year Forecast

To achieve the original FY01 goals, INEEL will need to ship 132 more shipments with an anticipated waste volume of 930.1 m^3 to meet their original planning. The current forecast is to ship 14 shipments in May 2001 and 32 shipments in June 2001. The associated volumes are 69.9 m^3 and 159.7 m^3. The ability to achieve these forecast shipment numbers and associated volumes is dependent on New Mexico Environment Department approval of the INEEL audit report for solids. The assumed approval date is May 4, 2001.

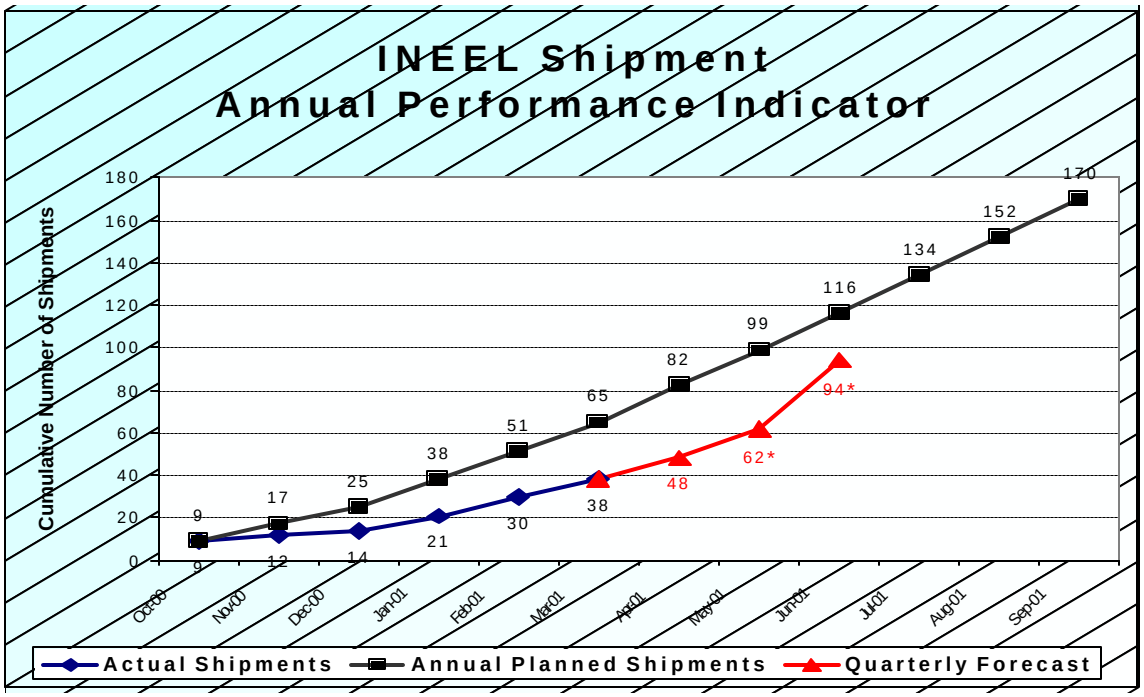
Performance Indicators

These Performance Indicators are graphically shown in the following figures:

- INEEL Volume Annual Performance Indicator - the actual volume shipped versus the planned volume to be shipped during FY01. The next quarter forecast is shown in red.
- INEEL Shipment Annual Performance Indicator - the actual number of shipments versus the planned number of shipments during FY01. The next quarter forecast is shown in red.



*Subject to New Mexico Environment Department approval of the INEEL audit report for solids (Assumed approval date of 5/4/01)



* Subject to New Mexico Environment Department approval of the INEEL audit report for solids (Assumed approval date of 5/4/01)

Los Alamos National Laboratory

Background

The first shipment from the Los Alamos National Laboratory (LANL) was shipped on March 25, 1999 and was received at WIPP on March 26, 1999. Through March 31, 2001, a total of 17 shipments from LANL representing 189.9 m^3 have been received.

Current Fiscal Year

As of March 31, 2001, during FY01, LANL has not shipped. Though planned to ship during this period, the required approval of the LANL Certification Audit Report by the New Mexico Environment Department was not received. In accordance with the requirements of the WIPP Hazardous Waste Facility Permit, each site's certification program must be audited and approved prior to the initiation of shipments from that site.

In comparison to initial planning for FY01, LANL had planned to ship 7 shipments consisting of 60.4 m^3 during this same time period.

Current Fiscal Year Forecast

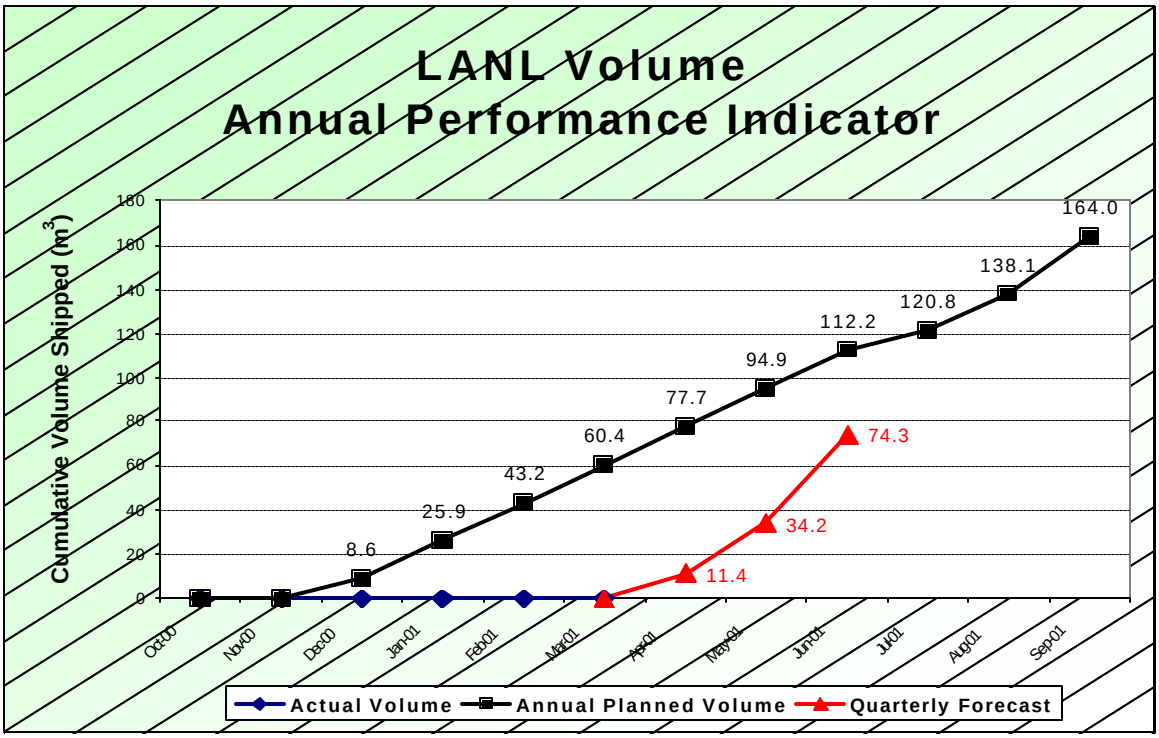
During the remainder of FY01, LANL will need to ship 19 more shipments with an anticipated waste volume of 164.0 m^3 to meet their original plans.

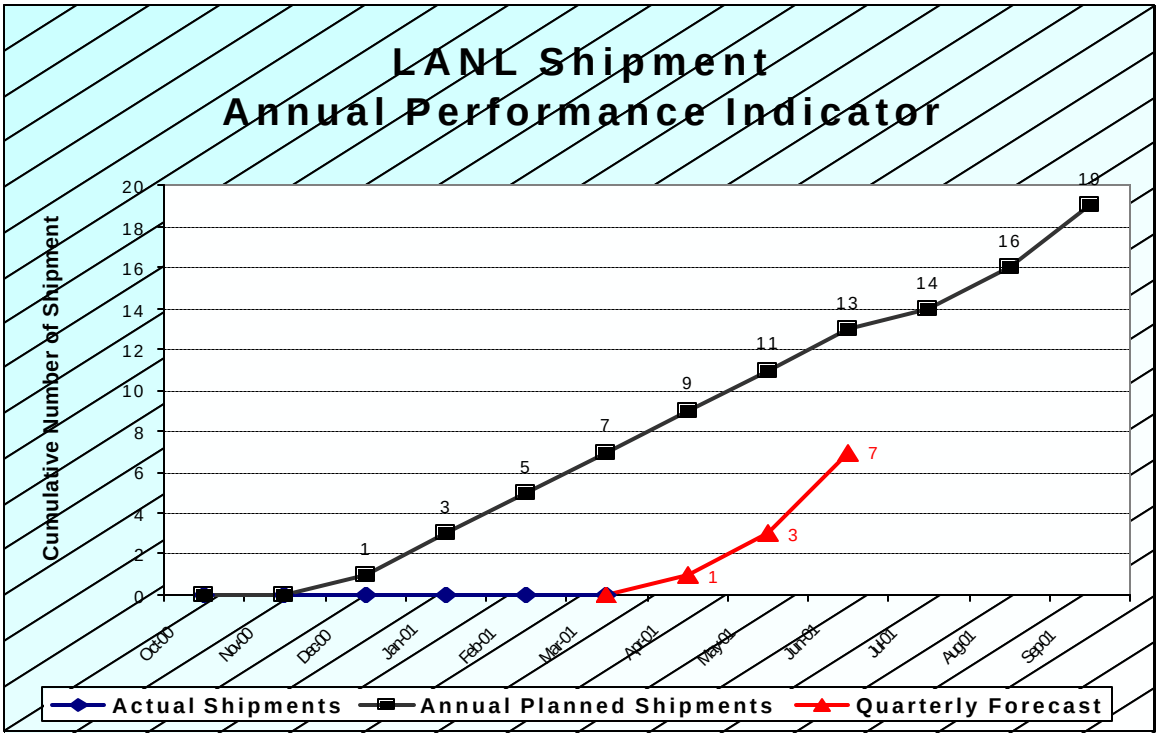
Performance Indicators

These Performance Indicators are graphically shown in the following figures:

- LANL Volume Annual Performance Indicator - the actual volume shipped versus the planned volume to be shipped during FY01. The next quarter forecast is shown in red.
- LANL Shipment Annual Performance Indicator - the actual number of shipments versus the planned number of shipments during FY01. The next quarter forecast is shown in red.

Los Alamos
NATIONAL LABORATORY





Rocky Flats Environmental Technology Site

Background

The first shipment from the Rocky Flats Environmental Technology Site (RFETS) was shipped on June 15, 1999 and was received at WIPP on June 17, 1999. Through March 31, 2001, a total of 111 shipments from RFETS representing 750.5 m^3 have been received.

Current Fiscal Year

As of March 31, 2001, during FY01, RFETS has shipped 57 shipments consisting of 436.6 m^3. In comparison to initial planning for FY01, RFETS had planned to ship 59 shipments consisting of 390.6 m^3 during this same time period.

Current Fiscal Year Forecast

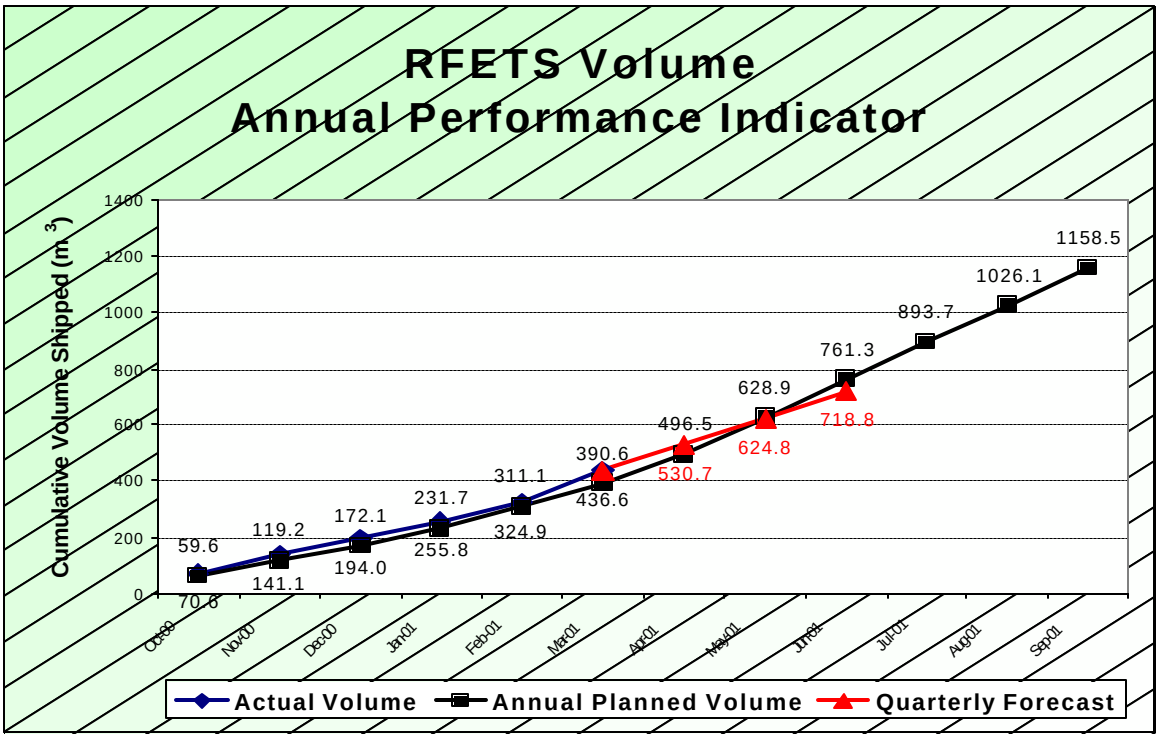
During the remainder of FY01, RFETS is scheduled to ship 118 more shipments with an anticipated waste volume of 721.9 m^3.

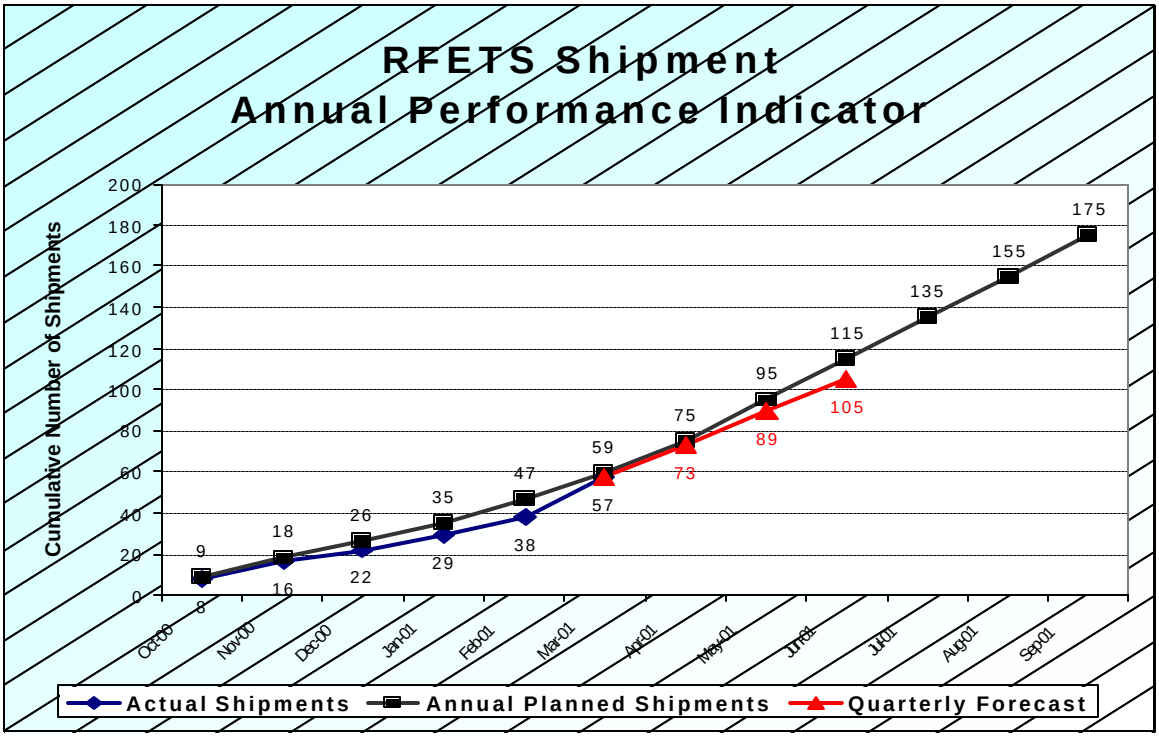
Performance Indicators

These Performance Indicators are graphically shown in the following figures:

- RFETS Volume Annual Performance Indicator - the actual volume shipped versus the planned volume to be shipped during FY01. The next quarter forecast is shown in red.
- RFETS Shipment Annual Performance Indicator - the actual number of shipments versus the planned number of shipments during FY01. The next quarter forecast is shown in red.

Rocky Flats


RFETS Volume
Annual Performance Indicator
Cumulative Volume Shipped (m3)
1400
1200
1000
800
600
400
200
0
59.6
70.6
119.2
141.1
172.1
194.0
231.7
255.8
311.1
324.9
390.6
436.6
496.5
530.7
628.9
624.8
761.3
718.8
893.7
1026.1
1158.5
Oct-00
Nov-00
Dec-00
Jan-01
Feb-01
Mar-01
Apr-01
May-01
Jun-01
Jul-01
Aug-01
Sep-01
Actual Volume
Annual Planned Volume
Quarterly Forecast


RFETS Shipment
Annual Performance Indicator
Cumulative Number of Shipments
200
180
160
140
120
100
80
60
40
20
0
9
8
18
16
26
22
35
29
47
38
59
57
75
73
95
89
115
105
135
155
175
Oct-00
Nov-00
Dec-00
Jan-01
Feb-01
Mar-01
Apr-01
May-01
Jun-01
Jul-01
Aug-01
Sep-01
Actual Shipments
Annual Planned Shipments
Quarterly Forecast

Savannah River Site

Background
The first shipment from the Savannah River Site (SRS) has not yet been shipped.

Current Fiscal Year
As of March 31, 2001, during FY01, SRS has not yet shipped. Though planning to ship during this period, the required approval of the SRS Certification Audit Report by the New Mexico Environment Department was not received. In accordance with the requirements of the WIPP Hazardous Waste Facility Permit, each site's certification program must be audited and approved prior to the initiation of shipments from that site.

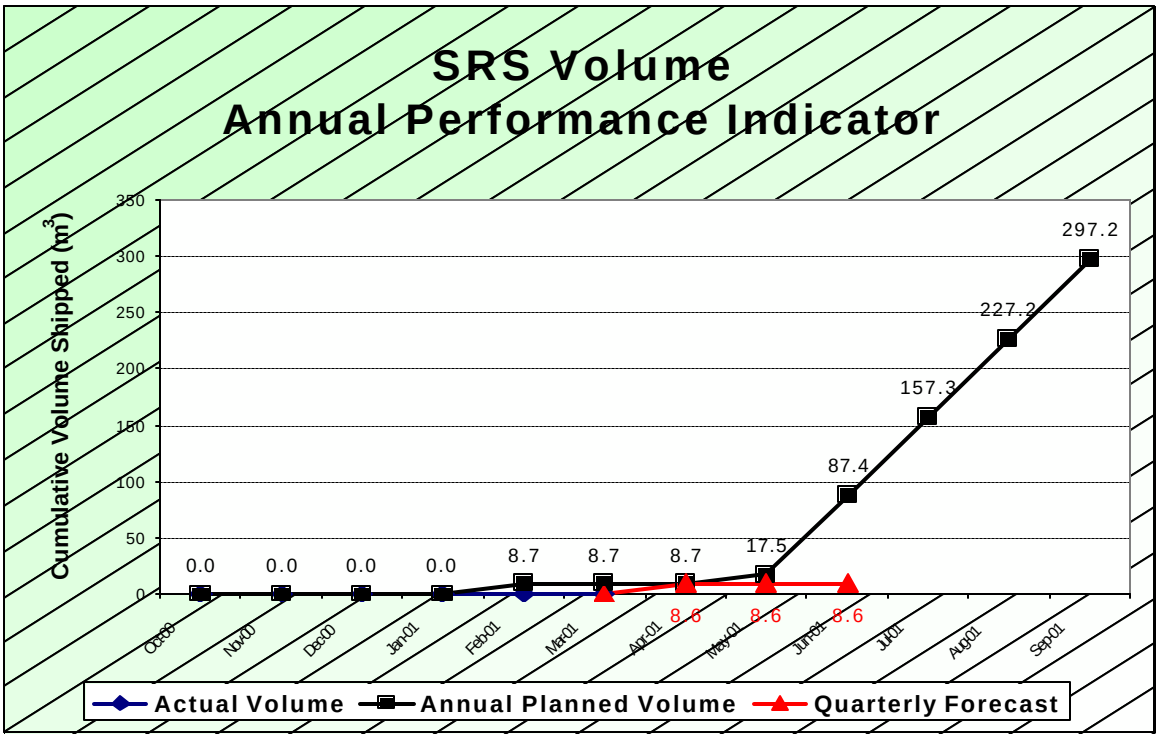
In comparison to initial projections for FY01, SRS was projected to ship 1 shipment consisting of 8.7 m^3 during this same time period.

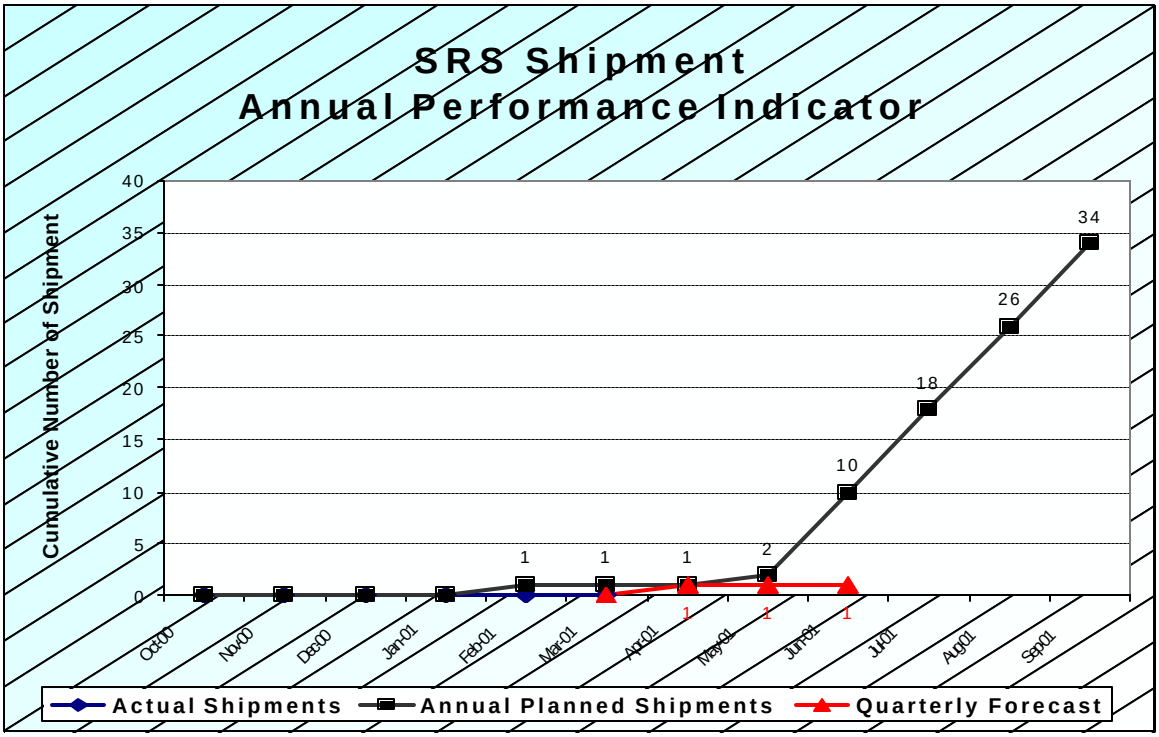
Current Fiscal Year Forecast
During the remainder of FY01, SRS will need to ship 34 more shipments with an anticipated waste volume of 297.2 m^3 to meet their original plans.

Performance Indicators These Performance Indicators are graphically shown in the following figures:

- SRS Volume Annual Performance Indicator - the actual volume shipped versus the planned volume to be shipped during FY01. The next quarter forecast is shown in red.
- SRS Shipment Annual Performance Indicator - the actual number of shipments versus the planned number of shipments during FY01. The next quarter forecast is shown in red.

DOE Savannah River Operations Office





Transportation

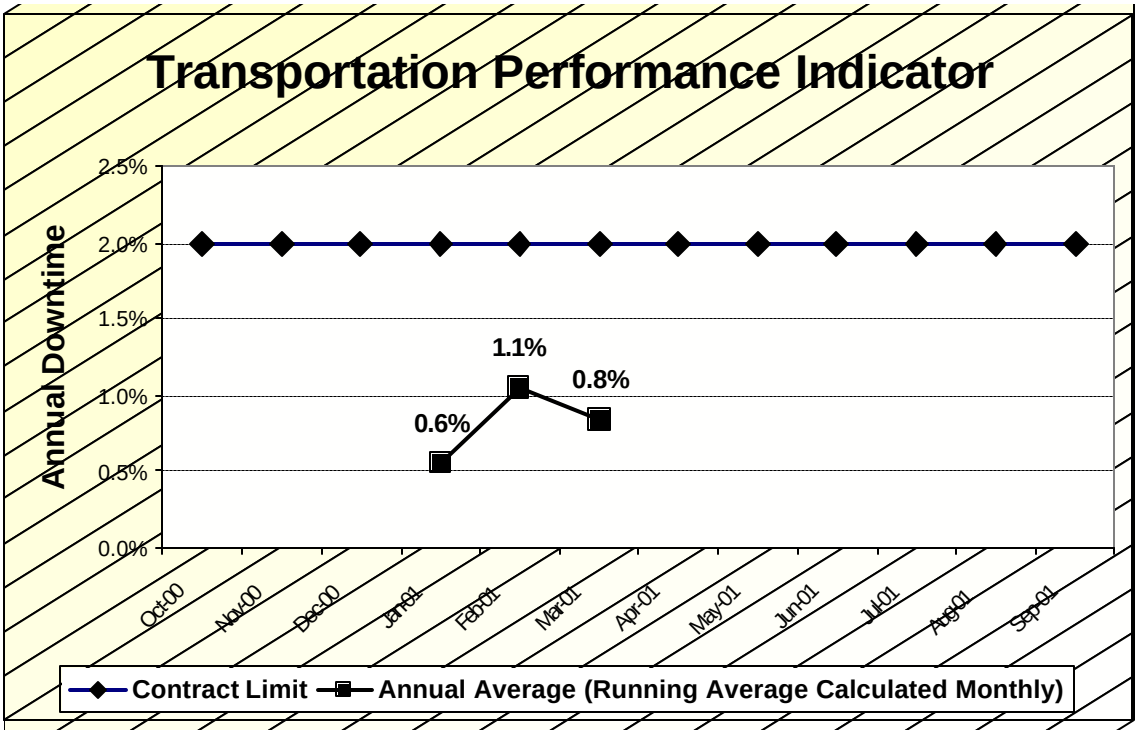
Background

The Performance Indicator for Transportation is the average annual downtime calculated as a monthly running average. From the contract, "Downtime" is defined as:

> "The cumulative amount of time that a truck set is not available versus the time that it is in a safe operating mode, expressed as a percentage. Scheduled preventative maintenance and generator site or WIPP site delays are not included in this calculation."

For comparison purposes, the contract limit is 2.0%. Few downtime hours have been accrued at this time.

The calculated downtime is shown graphically on the figure. Due to ongoing contract changes during the first three month of FY01, data for October, November, and December are not presented.



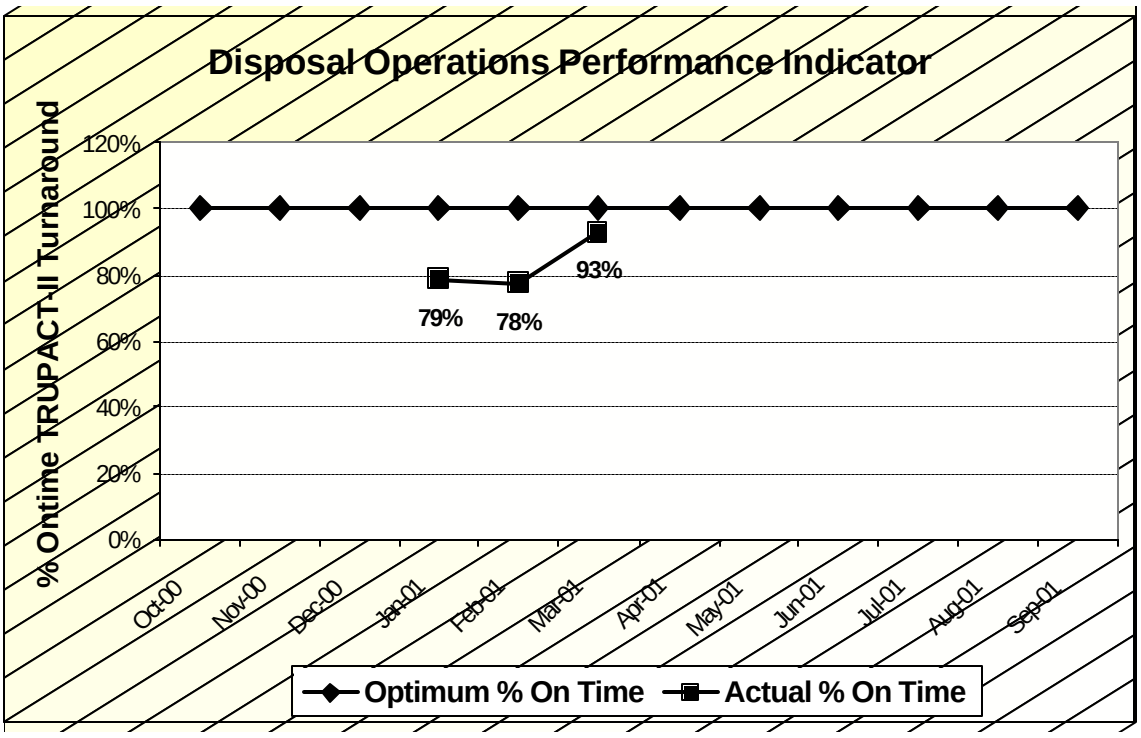
Disposal

Background

The Performance Indicator for Disposal Operations tracks on-time TRUPACT-II turnaround. This Performance Indicator shows whether disposal operations are able to turn around packaging to maintain the shipping schedule.

Due to the limited receipt schedule, the current turnaround times have fully satisfied TRU waste site shipping needs.

The percentage of on-time TRUPACT-II turnaround is shown graphically on the figure. Due to ongoing contract changes during the first three month of FY01, data for October, November, and December are not presented.



TRU Waste System

Background

Through March 31, 2001, a total of 188 shipments representing 1336.9 m^3 of TRU waste have been received.

Current Fiscal Year

As of March 31, 2001, during FY01, 98 shipments consisting of 692.4 m^3 have been received. In comparison to initial planning for FY01, 135 shipments consisting of 923.4 m^3 were anticipated during this same time period.

Current Fiscal Year Forecast

During the remainder of FY01, the TRU Waste System is planning to receive 305 more shipments with an anticipated waste volume of 2120.6 m^3 to meet the initial NTWMP planning values. These planned shipping schedules were based on discussions and negotiations with the TRU waste sites during the preparation of the NTWMP and reflect the sites' best estimates for the shipment of TRU waste. These schedules are periodically rebaselined to adjust for changes in the original forecast due to unplanned or unscheduled occurrences.

Performance Indicators

These Performance Indicators are graphically shown in the following figures:

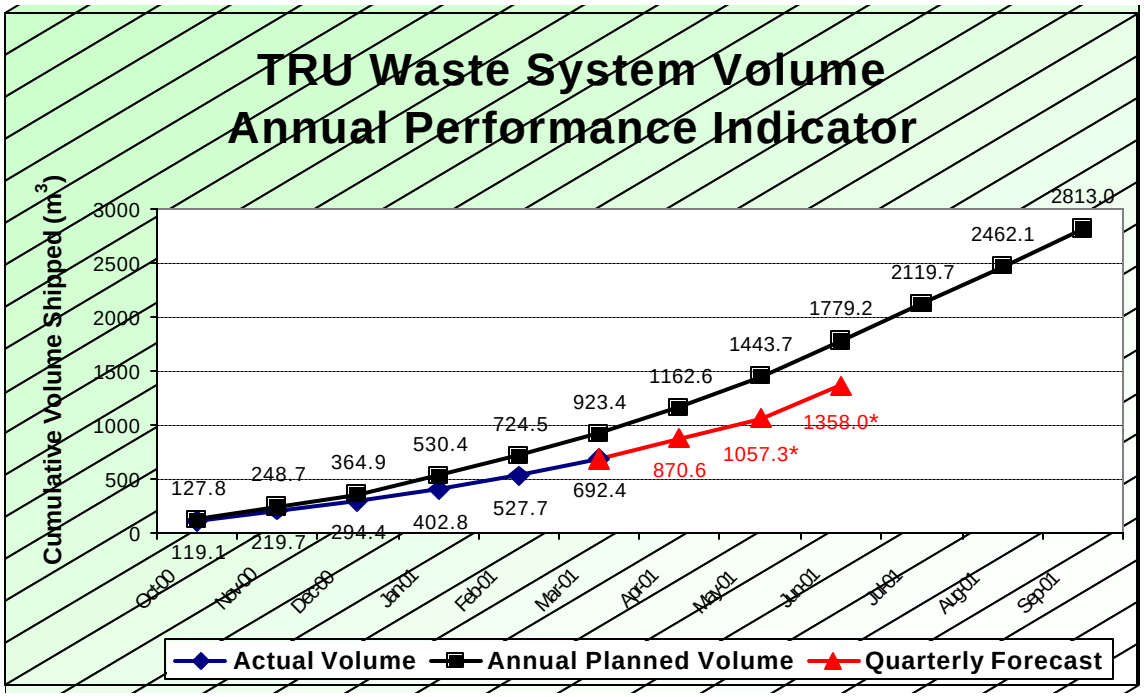
- TRU Waste System Actual Volume Performance Indicator - the actual volume shipped versus the planned volume to be shipped during FY01. The next quarter forecast is shown in red.
- TRU Waste System Shipment Performance Indicator - the actual number of shipments versus the planned number of shipments during FY01.The next quarter forecast is shown in red.

Analysis

During the current Fiscal Year, the cumulative number of shipments received as of March 31, 2001 was approximately 73% of the initially planned values expected to be shipped by this time based on the NTWMP. By volume, 75% of the planned amount of TRU waste was received. The less than anticipated values are due to learning curve considerations due to process development and implementation, lack of characterized and certified TRU waste inventory for shipment, delays in the approval of site certification audit documentation, and weather delays.

At the current rate of receipt (projecting the receipt rates during the month of March to forecast FY01 totals), total FY01 receipts will be only 66% of the originally planned number of shipments in the NTWMP. TRU waste volumes disposed will be only 60% of the originally planned TRU waste disposal volumes in the NTWMP.

To meet the original planning in the NTWMP, shipping rates for the month of March would need to increase by 80% (to approximately 51 shipments per month or 13 per week). Volume receipt rates would need to more than double (by increasing to 345 m^3 per month) to meet the projected FY01 cumulative volumes. Current transportation resources do not support these shipping rates.



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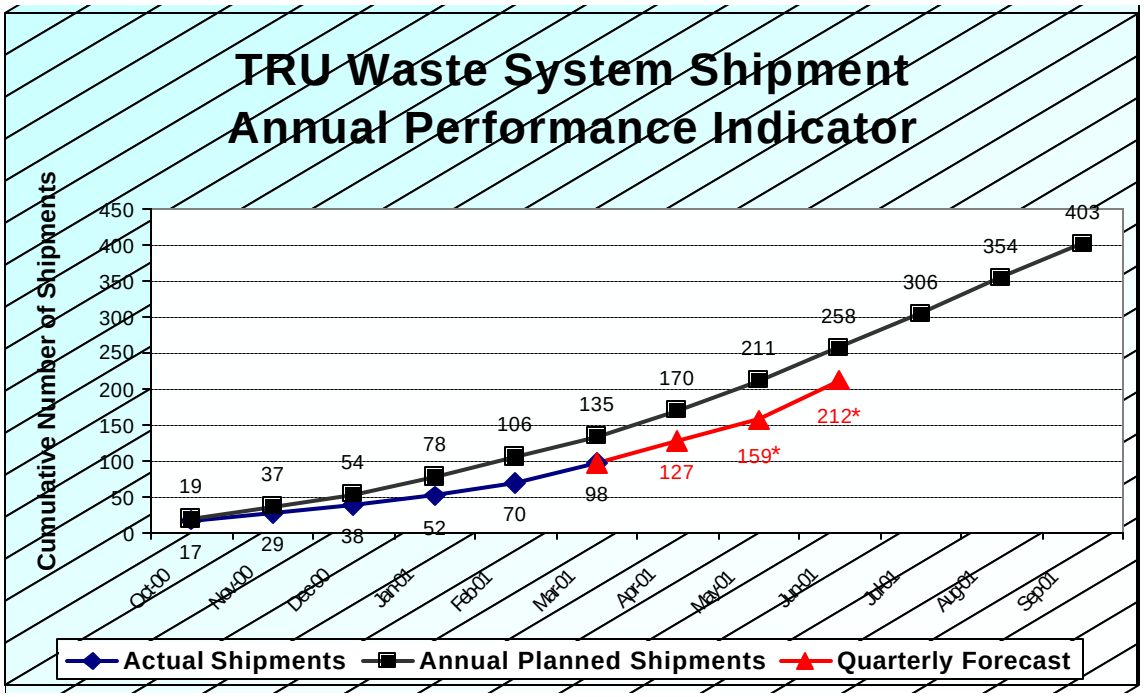

* Subject to New Mexico Environment Department approval of the INEEL audit report for solids (Assumed approval date of 5/4/01)

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Technical and Programmatic Issues

Since the issuance of the National TRU Waste Management Plan, several of the areas identified under Section 2.3, *Integrated Program Strategy*, have continued to make progress toward their goals and end-state. The areas of progress are noted in the following summaries.

2.3.1.9 Mode of Waste Transport

The CNS 10-160B was granted a Certificate of Compliance by the Nuclear Regulatory Commission on February 27, 2001 for the transport of limited quantities of transuranic materials from the Battelle Columbus Laboratory Decommissioning Project (BCLDP). As a singly contained packaging, the CNS 10-160B may only transport 20 curies of plutonium in any shipment. The packaging may be used to either transport the BCLDP TRU waste to WIPP for canisterization or may be used to consolidate the TRU waste at an intermediate site prior to shipment to WIPP.

Also, as discussed below in the summary for Section 2.3.1.17, the viability of TRU waste shipments to WIPP by rail is being investigated per the recommendations of the National Research Council.

2.3.1.10 Non-Standard TRU Waste Containers

A "TRUPACT-III Workshop" was held February 13-14, 2001, at the DOE-CBFO. This workshop was held to address that portion of the waste that is too large to be shipped in the TRUPACT-II or HalfPACT packagings. The TRUPACT-III Workshop also addressed a recommendation from the *CH-TRU Transportation System Rail Study* (DOE/WIPP 00-2016) to continue development of an alternative shipping package for CH-TRU waste for either rail or truck shipment. It is estimated that as much as 24 percent of the CH-TRU inventory may exist in oversized containers (4- x 4- x 7-feet or larger) that are not transportable in the TRUPACT-II or the HalfPACT. Options being considered are a) establish repackaging and size reduction facilities and repackage the oversized waste inventory into drums, SWBs, or TDOPs for transportation in the TRUPACT-II and the HalfPACT; b) design and develop a new packaging for the transportation of the oversized containers; c) use or modify an existing packaging; and d) some combination of the above options.

2.3.1.15 WIPP Panel Closure

A working meeting was held with the EPA on December 12, 2000, in Carlsbad, NM. During the meeting, the DOE discussed several enhancements proposed for the engineering design and construction of the panel closure system.

The primary purpose of the panel closure is for the hazardous waste disposal unit closure and to control potential volatile organic compound releases during waste management operations. Secondarily, in terms of long-term performance, the Compliance Certification Application and the EPA final rule note that the closure system will also influence fluid connections between waste panels. The following enhancements are being pursued which will allow construction flexibility, increase worker safety, improve the constructibility of the panel closures, and better ensure the closures perform as required. The enhancements are:

- Replace Salado Mass Concrete with a generic salt-based concrete
- Replace the Explosion Wall with a Construction Wall
- Replace freshwater grouting with salt-based grouting
- Allow local carbonate river rock aggregate in lieu of crushed quartz
- Allow surface- or underground-mixing
- Allow steel forms to be left in place or

removed

- Allow up to one-year for completion of closure in lieu of 180-days

2.3.1.16 WIPP Recertification

The Land Withdrawal Act mandates that the DOE provide documentation of continued compliance "not later than five years after the initial receipt of transuranic waste for disposal at WIPP, and every five years thereafter." WIPP has therefore established the *Compliance Recertification Project* as an integrated effort among the project participants for achieving a favorable determination from the EPA.

In December of 2000, the EPA published a guidance document for recertification. This guidance refers to the application as a Compliance Recertification Application (CRA). The Agency recommends the CRA be submitted in November of 2003. Therefore, the Project schedules reflect all activities to be completed such that a complete CRA will be delivered to the EPA during the recommended timeframe. This requires that consideration of all data with the potential to impact long-term performance of the repository be rolled up in advance and evaluated on a performance basis. Relevant information will be summarized for the period from October 1996 through September 2002. The key data will then be analyzed for its potential to impact long-term performance using the same calculations that were performed prior to receiving TRU waste.

2.3.1.17 Improving Operations and Long-Term Safety of WIPP

The National Research Council, organized by the National Academy of Sciences to provide services to the federal government, convened a committee of experts to advise the DOE on the operation of WIPP. The committee was asked to provide recommendations on two issues: (1) a research agenda to enhance confidence in the long-term performance of WIPP; and (2) increasing the throughput, efficiency, and cost-benefit without compromising safety in characterizing, certifying, packaging, and shipping waste to WIPP. In its interim report, the committee provided the DOE with recommendations on several issues that the committee believes merit immediate consideration and action. In developing their report, the committee was guided by the principle of "reasonableness" with respect to risks, costs, and the ALARA (as low as reasonably achievable) principle.

The CBFO adopted the Council's recommendations as part of its planning to bring WIPP to its full potential. A brief summary of the status of each recommendation follows.

- Plan to sample oil-field brines, petroleum, and solids associated with current hydrocarbon production to assess the magnitude and variability of naturally occurring radioactive material (NORM) in the vicinity of the WIPP site.
  Status: Due to lack of commitment by the local representatives of oil and gas industry to support this effort, this recommendation will not be acted upon.

- Eliminate self-imposed waste characterization requirements that lack a legal or safety basis.
  Status: The CBFO has submitted several permit modifications related to the following subjects: Drum Age Criteria; Digital Radiography/Computed Tomography scans to perform quality control of radiography; new hazardous waste codes; and a change in training requirements.

- Derive a more realistic radiolytic gas generation model.
  Status: Revision 19 of the TRUPACT-II Safety Analysis Report was submitted to

the Nuclear Regulatory Commission (NRC) in April 2000. The application requested the use of a lower gas generation value, provided a method for measuring flammable gas concentrations, and discussed the drum age criteria. These are in review by the NRC.

- Perform a safety analysis to determine the concentration and quantity of hydrogen that, upon ignition, could damage the seals of the TRUPACT-II shipping container.
  Status: This evaluation is on-going.

- Consider technical approaches for reducing hazards from hydrogen generation.
  Status: The DOE is actively pursuing several alternative technologies such as hydrogen "getters," use of an inert gas, internal bag breaching, and secondary packaging.

- Reevaluate the technical and regulatory feasibility of shipping high-wattage TRU waste using a railcar shipping system.
  Status: Discussions are underway with the railroad on feasibility and costs of shipping TRU waste by rail.

- Consider cost-effective ways to improve the reliability and ease of use of the TRANSCOM system, either by improving or replacing it.
  Status: The TRANSCOM2000 program has been implemented and training was completed by CBFO in March 2001.

- Explore with states and other interested parties how to develop processes and tools for maintaining up-to-date spatial information on the location, capabilities, and contact information of responders, medical facilities, recovery equipment, regional response teams, and other resources that might be needed to respond to a WIPP transportation incident.
  Status: The CBFO has discussed this subject with the regional, state, and Indian tribal governments with whom it has cooperative agreements to respond, analyze, and develop a path forward on this recommendation. Based on feedback from these organizations, the current program is believed to be adequate and will be maintained as is.

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Optimization

The National TRU Waste System Optimization Project was initiated by the Department of Energy's Carlsbad Field Office and chartered to transition the DOE TRU Waste System from the baseline to a state of optimized efficiency. The Optimization Plan developed for this project is now in review by the Carlsbad Field Office.


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